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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,320	03/29/2001	Truc Q. Vu	PD-99W028	2273

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EXAMINER	
NGUYEN, LUONG TRUNG	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/821,320	VU ET AL.	
	Examiner	Art Unit	
	LUONG T. NGUYEN	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6,7,9,12,13 and 15-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/31/2005 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-3, 6-7, 9, 12-13, 15-39 filed on 8/31/2005 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869).

Regarding claim 1, Hynecek ('070) discloses a detector comprising transistor sensitive to electromagnetic energy (transistor 60, figures 2, 3, 3a, column 6, lines 25-51), said transistor

having a body (figures 2-3), a gate terminal (gate 72, figures 2-3), a source terminal and a drain terminal (see figures 2-3); means for biasing (bias transistor 80, figures 2, 3, 3a, column 7, lines 5-20) said transistor whereby an output thereof is responsive to said electromagnetic energy (output line 74, figures 2, 3, 3a).

Hynecek ('070) fails to disclose the body of said transistor being configured to float. However, Eitan et al. teaches a field effect transistor 10 includes floating gate 10FG, which separates from substrate (body)18 of the transistor 10 (figure 2, column 3, lines 22-62, and see abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070) by the teaching of Eitan et al. in order to provide a transistor, in which the threshold voltage required to turn on the device is controlled by varying the charge on the floating gate (column 1, lines 20-25).

Regarding claim 2, Hynecek ('070) discloses electromagnetic radiation is light (incident light, column 6, lines 48-50).

Regarding claim 3, Hynecek ('070) discloses said light is in the visible portion of the electromagnetic spectrum (incident light, column 6, lines 48-50).

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) further in view of Hynecek (US 6,580,106).

Regarding claims 6-7, Hynecek ('070) and Eitan et al. fail to specifically disclose said transistor is an n-channel complementary metal-oxide semiconductor transistor. However,

Hynecek ('106) discloses a CMOS image sensor comprises transistor 203, which is an n-channel complementary metal-oxide semiconductor transistor (figures 2, 4, column 4, lines 42-49). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070) and Eitan et al. by the teaching of Hynecek ('106) in order to provide a CMOS image sensor employing pixels that can be readout repeatedly and do not generate kTC noise (column 2, lines 16-19).

6. Claims 9, 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) further in view of Tashiro (US 6,501,062).

Regarding claim 9, Hynecek ('070) discloses an imager comprising first means for detecting input illumination (sensor array 12, figures 1-2, column 5, lines 32-37), said first means including an array of detectors (array of transistor sensor elements 60, figure 2, column 6, lines 25-30), each detector including a transistor sensitive to electromagnetic radiation (transistor 60, figures 2, 3, 3a, column 6, lines 25-51), said transistor having a body (figures 2-3), a gate terminal (gate 72, figures 2-3), a source terminal and a drain terminal (see figures 2-3); second means for biasing said transistors (bias transistors 80, figures 2, 3, 3a, column 7, lines 5-20); and third means for detecting an output from each of said biased detectors in response to electromagnetic radiation (output lines 74, figure 2).

Hynecek ('070) fails to disclose the body of said transistor being configured to float. However, Eitan et al. teaches a field effect transistor 10 includes floating gate 10FG, which separates from substrate (body)18 of the transistor 10 (figure 2, column 3, lines 22-62, and see abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the device in Hynecek ('070) by the teaching of Eitan et al. in order to provide a transistor, in which the threshold voltage required to turn on the device is controlled by varying the charge on the floating gate (column 1, lines 20-25).

Hynecek ('070) and Eitan et al. fail to disclose the transistor being formed on top of an insulating substrate which is transparent to visible light. However, Tashiro teaches an image pickup apparatus, in which thin film transistors are generally formed on a transparent insulating substrate (column 3, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070) and Eitan et al. by the teaching of Tashiro in order to allow light enter to the interior of the substrate.

Regarding claim 15, Hynecek ('070) discloses means for selectively activating said transistors (row decoder 14, figure 1).

Regarding claim 16, Hynecek ('070) discloses means for sequentially activating said transistors (row decoder 14, figure 1).

Regarding claim 17, Hynecek ('070) discloses means for randomly activating said transistors (row decoder 14, figure 1).

Regarding claim 18, Hynecek ('070) discloses said third means includes a differential amplifier (charge amplifiers 40,42, figure 1).

Regarding claim 19, Hynecek ('070) discloses said amplifier is a current sense differential amplifier (charge amplifiers 40,42, figure 1).

Regarding claim 20, Hynecek ('070) discloses means for supplying a reference voltage to said current sense differential amplifier (voltage supply VDD2, figure 1, column 5, lines 60-65).

Regarding claim 21, Hynecek ('070) discloses electromagnetic radiation is light (incident light, column 6, lines 48-50).

Regarding claim 22, Hynecek ('070) discloses said light is in the visible portion of the electromagnetic spectrum (incident light, column 6, lines 48-50).

7. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) and Tashiro (US 6,501,062) further in view of Hynecek (US 6,580,106).

Regarding claims 12-13, Hynecek ('070), Eitan et al. and Tashiro fail to specifically disclose said transistor is an n-channel complementary metal-oxide semiconductor transistor. However, Hynecek ('106) discloses a CMOS image sensor comprises transistor 203, which is an n-channel complementary metal-oxide semiconductor transistor (figures 2, 4, column 4, lines 42-49). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Hynecek ('106) in order to provide a CMOS image sensor employing pixels that can be readout repeatedly and do not generate kTC noise (column 2, lines 16-19).

8. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) and Tashiro (US 6,501,062) further in view of Yu (US 6,008,843).

Regarding claim 23, Hynecek ('070), Eitan et al. and Tashiro fail to disclose means for mounting a first color filter between said light and one or more of a first set of said detectors. However, Yu teaches a red filter layer mounted on pixel 11 (figure 1b, column 1, lines 15-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Yu in order to allow only light of each predetermined wavelength to be incident on the photodiode (column 1, lines 42-44).

Regarding claim 24, Hynecek ('070), Eitan et al. and Tashiro fail to disclose means for mounting a second color filter between said light and one or more of a second set of said detectors. However, Yu teaches a blue filter layer mounted on pixel 11 (figure 1b, column 1, lines 15-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Yu in order to allow only light of each predetermined wavelength to be incident on the photodiode (column 1, lines 42-44).

Regarding claim 25, Hynecek ('070), Eitan et al. and Tashiro fail to disclose means for mounting a third color filter between said light and one or more of a third set of said detectors. However, Yu teaches a green filter layer mounted on pixel 11 (figure 1b, column 1, lines 15-50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Yu in order to allow only light of each predetermined wavelength to be incident on the photodiode (column 1, lines 42-44).

9. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) and Tashiro (US 6,501,062) further in view of Shimomura et al. (US 6,738,164).

Regarding claim 26, Hynecek ('070), Eitan et al. and Tashiro fail to disclose a grating for directing light of a first color to one or more of a first set of said detectors. However, Shimomura et al. teaches a grating 2, which separates the light beam enter to receiving means 3 into light beans of predetermined colors (e.g., red, blue, green), figures 7A-7B, column 5, lines 9-23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Shimomura et al. in order to read color images highly accurately (column 3, lines 45-50).

Regarding claim 27, Hynecek ('070), Eitan et al. and Tashiro fail to disclose the grating is adapted to direct light of a second color to one or more of a second set of said detectors. However, Shimomura et al. teaches a grating 2, which separates the light beam enter to receiving means 3 into light beans of predetermined colors (e.g., red, blue, green), figures 7A-7B, column 5, lines 9-23. Therefore, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Shimomura et al. in order to read color images highly accurately (column 3, lines 45-50).

Regarding claim 28, Hynecek ('070), Eitan et al. and Tashiro fail to disclose the grating is adapted to direct light of a third color to one or more of a third set of said detectors. However, Shimomura et al. teaches a grating 2, which separates the light beam enter to receiving means 3 into light beans of predetermined colors (e.g., red, blue, green), figures 7A-7B, column 5, lines 9-23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Shimomura et al. in order to read color images highly accurately (column 3, lines 45-50).

10. Claims 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) and Tashiro (US 6,501,062) further in view of Hynecek (US 6,580,106).

Regarding claim 29, Hynecek ('070) discloses an imager comprising first means for detecting input illumination (sensor array 12, figures 1-2, column 5, lines 32-37), said first means including an array of detectors (array of transistor sensor elements 60, figure 2, column 6, lines 25-30), each detector including a transistor sensitive to electromagnetic radiation (transistor 60, figures 2, 3, 3a, column 6, lines 25-51); second means for biasing, selectively and sequentially activating said transistors (bias transistors 80, figures 2, 3, 3a, column 7, lines 5-20); and third

means for detecting an output from each of said biased detectors in response to electromagnetic radiation, said third means including a differential amplifier (output lines 74, charge amplifiers 40, 42, figure 2).

Hynecek ('070) fails to disclose each of said transistors having a body configured to float. However, Eitan et al. teaches a field effect transistor 10 includes floating gate 10FG, which separates from substrate (body)18 of the transistor 10 (figure 2, column 3, lines 22-62, and see abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070) by the teaching of Eitan et al. in order to provide a transistor, in which the threshold voltage required to turn on the device is controlled by varying the charge on the floating gate (column 1, lines 20-25).

Hynecek ('070) and Eitan et al. fail to disclose each transistor being formed on top of an insulating substrate which is transparent to visible light. However, Tashiro teaches an image pickup apparatus, in which thin film transistors are generally formed on a transparent insulating substrate (column 3, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070) and Eitan et al. by the teaching of Tashiro in order to allow light enter to the interior of the substrate.

Hynecek ('070), Eitan et al. and Tashiro fail to specifically disclose said transistor is an n-channel complementary metal-oxide semiconductor transistor. However, Hynecek ('106) discloses a CMOS image sensor comprises transistor 203, which is an n-channel complementary metal-oxide semiconductor transistor (figures 2, 4, column 4, lines 42-49). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al. and Tashiro by the teaching of Hynecek ('106)

in order to provide a CMOS image sensor employing pixels that can be readout repeatedly and do not generate kTC noise (column 2, lines 16-19).

Regarding claim 30, Hynecek ('070) discloses said amplifier is a current sense differential amplifier (charge amplifiers 40,42, figure 1).

Regarding claim 31, Hynecek ('070) discloses means for supplying a reference voltage to said current sense differential amplifier (voltage supply VDD2, figure 1, column 5, lines 60-65).

Regarding claim 32, Hynecek ('070) discloses electromagnetic radiation is light (incident light, column 6, lines 48-50).

Regarding claim 33, Hynecek ('070) discloses said light is in the visible portion of the electromagnetic spectrum (incident light, column 6, lines 48-50).

11. Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) and Tashiro (US 6,501,062) further in view of Hynecek (US 6,580,106) and Yu (US 6,008,843).

Regarding claim 34, Hynecek ('070), Eitan et al. Tashiro and Hynecek ('106) fail to disclose means for mounting a first color filter between said light and one or more of a first set of said detectors. However, Yu teaches a red filter layer mounted on pixel 11 (figure 1b, column 1, lines 15-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to modify the device in Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) by the teaching of Yu in order to allow only light of each predetermined wavelength to be incident on the photodiode (column 1, lines 42-44).

Regarding claim 35, Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) fail to disclose means for mounting a second color filter between said light and one or more of a second set of said detectors. However, Yu teaches a blue filter layer mounted on pixel 11 (figure 1b, column 1, lines 15-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) by the teaching of Yu in order to allow only light of each predetermined wavelength to be incident on the photodiode (column 1, lines 42-44).

Regarding claim 36, Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) fail to disclose means for mounting a third color filter between said light and one or more of a third set of said detectors. However, Yu teaches a green filter layer mounted on pixel 11 (figure 1b, column 1, lines 15-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) by the teaching of Yu in order to allow only light of each predetermined wavelength to be incident on the photodiode (column 1, lines 42-44).

12. Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynecek (US 4,819,070) in view of Eitan et al. (US 4,758,869) and Tashiro (US 6,501,062) further in view of Hynecek (US 6,580,106) and Shimomura et al. (US 6,738,164).

Regarding claim 37, Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) fail to disclose a grating for directing light of a first color to one or more of a first set of said detectors. However, Shimomura et al. teaches a grating 2, which separates the light beam enter to receiving means 3 into light beans of predetermined colors (e.g., red, blue, green), figures 7A-7B, column 5, lines 9-23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) by the teaching of Shimomura et al. in order to read color images highly accurately (column 3, lines 45-50).

Regarding claim 38, Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) fail to disclose the grating is adapted to direct light of a second color to one or more of a second set of said detectors. However, Shimomura et al. teaches a grating 2, which separates the light beam enter to receiving means 3 into light beans of predetermined colors (e.g., red, blue, green), figures 7A-7B, column 5, lines 9-23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) by the teaching of Shimomura et al. in order to read color images highly accurately (column 3, lines 45-50).

Regarding claim 39, Hynecek ('070), Eitan et al., Tashiro and Hynecek ('106) fail to disclose the grating is adapted to direct light of a third color to one or more of a third set of said detectors. However, Shimomura et al. teaches a grating 2, which separates the light beam enter to receiving means 3 into light beans of predetermined colors (e.g., red, blue, green), figures 7A-7B, column 5, lines 9-23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Hynecek ('070), Eitan etal., Tashiro and Hynecek ('106) by the teaching of Shimomura et al. in order to read color images highly accurately (column 3, lines 45-50).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NGOCYEN VU can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
11/13/05

LUONG T. NGUYEN
PATENT EXAMINER